

Taking into account the validation in the requirements engineering

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Scientific Context

Formal methods and abstract models help us to control the development and the complexity of systems. The validation of these models is a critical issue for the correction of the software all along its development process. Our recent works lead us to the next questions relatively to the validation :

- Elicitation and formalization of the customer requirements. Different case studies show us the potential of tools like ProR under the Rodin platform (<http://www.event-b.org>) to link requirements, formal models and refinement [5, 2, 6, 7].
- A progressive introduction of the formal properties. For example, the levels of compliance guide the refinement.
- Tools. Abstract models can be executed during the development process; the behaviour of the models can be observed, for example, with the JeB tool [8].

The evolution of the refinement of a model takes into account the dynamic of the development. The refinement allows the verification of the formal specification at each development step [1]. The work goes to a safe solution by demonstrating the relations between the successive states of the model.

The goal of our work provides this level of assurance by validating the successive models [4, 5, 3]. The basic principle is to identify an increment of coverage requirements by managing the links between requirements and formal models, and to validate them relatively of this increment.

PhD subject

This subject is to study the validation in the first steps of the development of complex systems by detecting errors in the requirements and in formal models using the refinement. It concerns the validation study since the first development steps for complex systems, in order to obtain a reliable system. Some work paths concern :

- Contribution of invariants and theorems for the validation.
- Retrieval of validation items and their automation.
- Memorisation and history management of the validation.
- Feedback from the verification relating the requirements.

The Rodin platform (<http://www.event-b.org>) will be updated.

Work organization

The person recruited will be required to communicate regularly with he/her supervisor.
The knowledge of tools like the Rodin platform (<http://www.event-b.org>) will be significant.

References

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